

CES-35 – Redes de Computadores e Internet

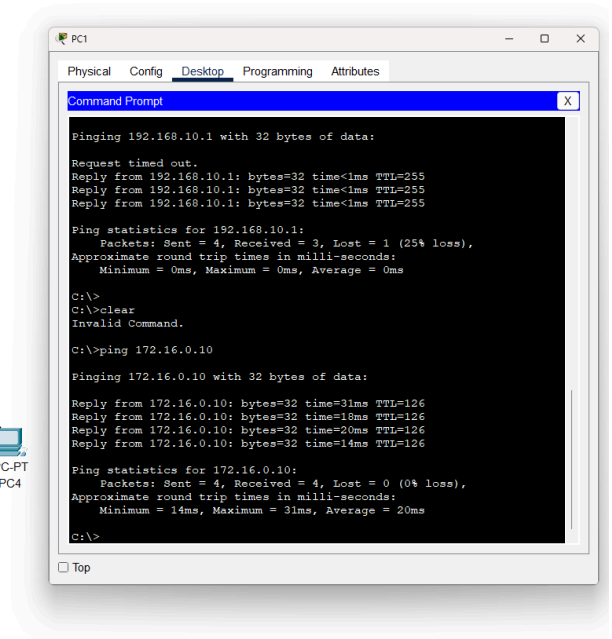
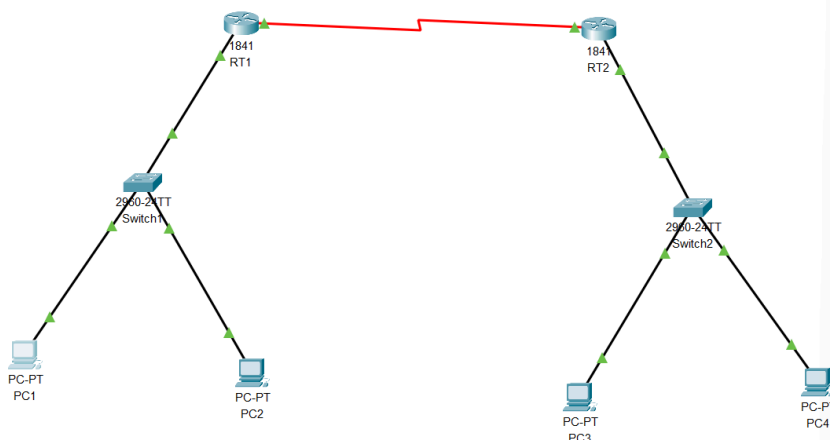
Laboratório 4: Simulando Rede com Packet Tracer

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Data: 23/10/2024

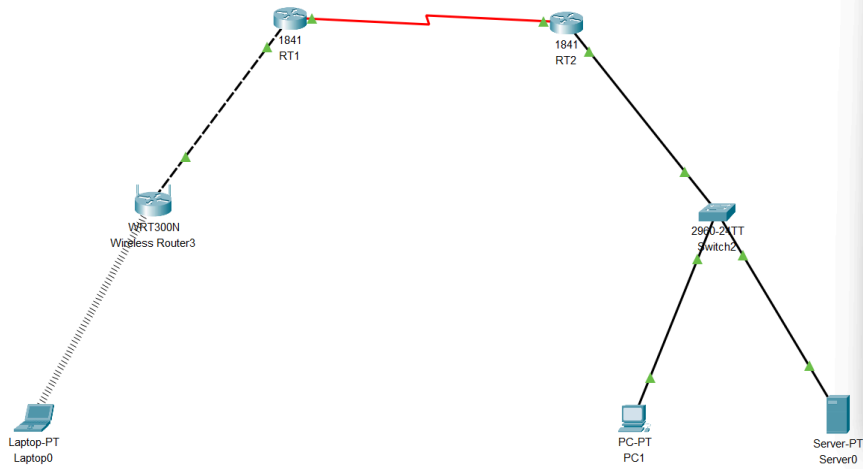
PARTE 1

Ping do PC1 (192.168.0.10) no PC3 (172.16.0.10)



PARTE 2

Ping do Laptop0 (192.168.1.100) no PC1 (172.16.0.3)



```
Laptop0
Physical Config Desktop Programming Attributes
Command Prompt
Pinging 172.16.0.1 with 32 bytes of data:
Reply from 172.16.0.1: bytes=32 time=72ms TTL=253
Reply from 172.16.0.1: bytes=32 time=32ms TTL=253
Reply from 172.16.0.1: bytes=32 time=48ms TTL=253

Ping statistics for 172.16.0.1:
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 32ms, Maximum = 72ms, Average = 50ms

Control-C
^C
C:\>ping 172.16.0.3

Pinging 172.16.0.3 with 32 bytes of data:
Reply from 172.16.0.3: bytes=32 time=25ms TTL=125
Reply from 172.16.0.3: bytes=32 time=28ms TTL=125
Reply from 172.16.0.3: bytes=32 time=14ms TTL=125
Reply from 172.16.0.3: bytes=32 time=33ms TTL=125

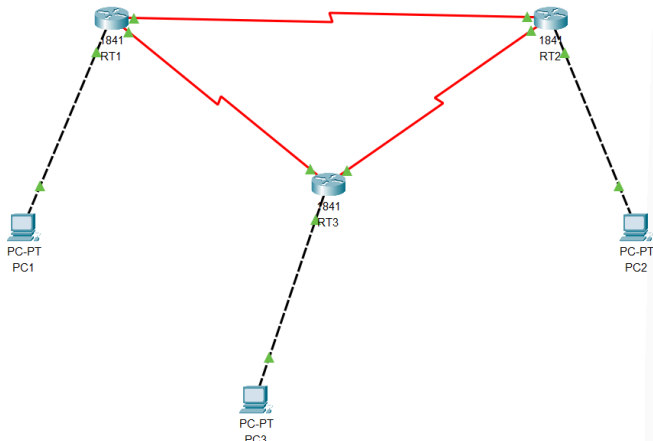
Ping statistics for 172.16.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 14ms, Maximum = 33ms, Average = 25ms

C:\>
```

PARTE 3

Ping PC1 (172.16.30.2) no PC2 (172.16.10.2)

Ping PC1 (172.16.30.2) no PC3 (172.16.20.2)



```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>
C:\>
C:\>ping 172.16.10.2

Pinging 172.16.10.2 with 32 bytes of data:

Reply from 172.16.10.2: bytes=32 time=14ms TTL=126
Reply from 172.16.10.2: bytes=32 time=1ms TTL=126
Reply from 172.16.10.2: bytes=32 time=1ms TTL=126
Reply from 172.16.10.2: bytes=32 time=1ms TTL=126

Ping statistics for 172.16.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 14ms, Average = 4ms

C:\>ping 172.16.20.2

Pinging 172.16.20.2 with 32 bytes of data:

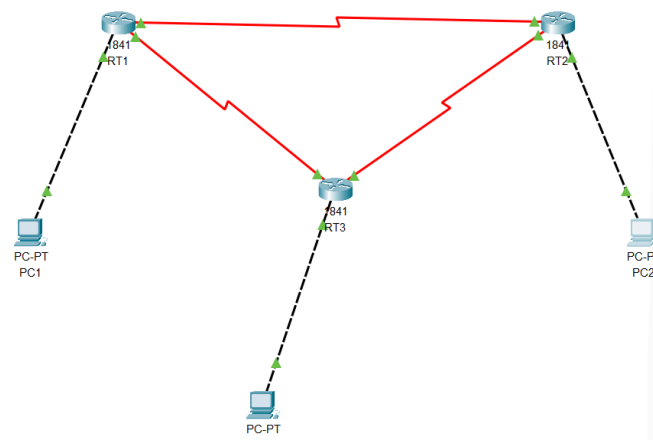
Reply from 172.16.20.2: bytes=32 time=28ms TTL=126
Reply from 172.16.20.2: bytes=32 time=1ms TTL=126
Reply from 172.16.20.2: bytes=32 time=20ms TTL=126
Reply from 172.16.20.2: bytes=32 time=16ms TTL=126

Ping statistics for 172.16.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 28ms, Average = 16ms

C:\>
```

Ping PC2 (172.16.10.2) no PC1 (172.16.30.2)

Ping PC2 (172.16.10.2) no PC3 (172.16.20.2)



```
PC2
Physical Config Desktop Programming Attributes
Command Prompt
C:\>
C:\>
C:\>ping 172.16.30.2

Pinging 172.16.30.2 with 32 bytes of data:

Reply from 172.16.30.2: bytes=32 time=1ms TTL=126
Reply from 172.16.30.2: bytes=32 time=12ms TTL=126
Reply from 172.16.30.2: bytes=32 time=19ms TTL=126
Reply from 172.16.30.2: bytes=32 time=19ms TTL=126

Ping statistics for 172.16.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 19ms, Average = 12ms

C:\>ping 172.16.20.2

Pinging 172.16.20.2 with 32 bytes of data:

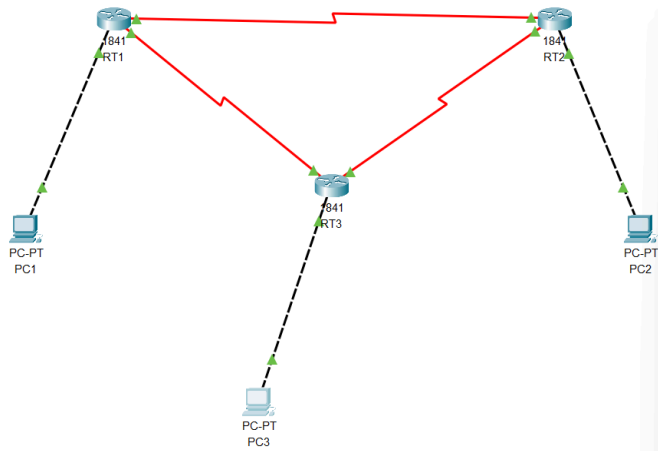
Reply from 172.16.20.2: bytes=32 time=1ms TTL=126
Reply from 172.16.20.2: bytes=32 time=1ms TTL=126
Reply from 172.16.20.2: bytes=32 time=1ms TTL=126
Reply from 172.16.20.2: bytes=32 time=20ms TTL=126

Ping statistics for 172.16.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 20ms, Average = 5ms

C:\>
```

Ping PC3 (172.16.20.2) no PC2 (172.16.10.2)

Ping PC3 (172.16.20.2) no PC1 (172.16.30.2)



```
PC3
Physical Config Desktop Programming Attributes
Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.16.10.2

Pinging 172.16.10.2 with 32 bytes of data:

Reply from 172.16.10.2: bytes=32 time=1ms TTL=126
Reply from 172.16.10.2: bytes=32 time=1ms TTL=126
Reply from 172.16.10.2: bytes=32 time=20ms TTL=126
Reply from 172.16.10.2: bytes=32 time=20ms TTL=126

Ping statistics for 172.16.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 20ms, Average = 10ms

C:\>ping 172.16.30.2

Pinging 172.16.30.2 with 32 bytes of data:

Reply from 172.16.30.2: bytes=32 time=1ms TTL=126
Reply from 172.16.30.2: bytes=32 time=1ms TTL=126
Reply from 172.16.30.2: bytes=32 time=16ms TTL=126
Reply from 172.16.30.2: bytes=32 time=1ms TTL=126

Ping statistics for 172.16.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 16ms, Average = 4ms

C:\>
```

PARTE 4

Ao simularmos uma falha entre RT1 e RT3, os roteadores trocam pacotes entre si para descobrir qual a melhor rota disponível para atingir a rede que se encontra o PC3, que não mais seria a rota direta de RT1 e RT3. Assim, ao descobrir que a nova rota é RT1 para RT2, e de RT2 para RT3, os pacotes passam a ser entregues ao PC3 utilizando-se desta rota alternativa que, no momento, seria a melhor. Ao voltar a conexão entre RT1 e RT3, o algoritmo utilizado para definir as melhores rotas ainda está atuando, e ele encontra a nova melhor rota (que seria a ideal desde antes de ter a falha), que seria uma diretamente de RT1 para RT3. Assim, os pacotes passam a viajar nesta rota, que volta a ser a ideal.

A conclusão que tiramos é que o uso de OSPF faz as conexões entre roteadores ser mais estável e tolerante a falhas, devido ao cálculo dinâmico que é realizado, de tempos em tempos, para definir-se uma melhor rota até um determinado destino (rede LAN de algum dos roteadores), desde que ainda haja tal rota disponível. Embora ele custe processamento entre os roteadores (executa o algoritmo de Dijkstra para encontrar sempre o “melhor” caminho), ele pode ser muito útil para evitar perda de comunicação desnecessária entre computadores de duas LANs.